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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,051	11/07/2001	Jaehyeong Kim	13-4	5569
46368	7590	06/27/2006	EXAMINER	
CARLSON, GASKEY & OLDS, P.C. 400 W MAPLE RD SUITE 350 BIRMINGHAM, MI 48009			WONG, LINDA	
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			2611	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

SK

<b>Office Action Summary</b>	Application No. 10/037,051	Applicant(s) KIM ET AL.	
	Examiner Linda Wong	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-8, 10-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-8, 10-14, 16-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 4/17/2006 have been fully considered but they are not persuasive.

- a. On page 1 of the applicant's arguments, the applicant argues

"the proposed substitution of Hahm's technique for the multiplying technique in Wheatley cannot be done because it entirely removes the functionality disclosed in the Wheatley reference. That is not a permissible modification of a reference under 35 USC 103. There is no prima facie case of obviousness because there is no motivation for making such a modification to the teachings of Wheatley and the combination of Wheatley and Hahm cannot be made".

The examiner respectfully disagrees. Wheatley discloses a "multiply module 814 using a peak windowing algorithm, multiplies the filtered samples, i.e., the output samples from the filter 812, with an aligned peak window using the actual window weights from the window weight module 810, to create modified samples. The peak windowing algorithm is applied to the filter 812 output samples." (paragraph [0060]) The purpose of the multiply module is to ensure that the peak to average ratio (PAR) calculated after the multiplication has been performed, has been reduced to reach the target PAR or below the target PAR. (paragraph [0062]) By reducing the peak to average ratio, the peaks are either canceled or reduced.

Hahm discloses subtracting the peaks within a window or period (Fig. 4d) from the delayed input signal. (Fig. 4A and Col. 3, lines 21-67, Col. 4 and Col. 5) By subtracting the peaks from the input signal,  $I(t)$  or  $I'(t)$  (Fig. 3) is "a peak

limited signal with a reduced P/A ratio, and is without significant out-of-band spectral artifacts.” (Col. 6, lines 49-53)

Since the purpose of Hahm’s subtraction method and Wheatley’s multiplication method is to reduce the PAR by eliminating the peak from the input signal, the motivation for using of replacing Wheatley’s multiplication method with Hahm’s subtraction method is disclosed by both and both methods will accomplish the desired outcome; a lowered or reduced PAR.

- b. On page 2 of the applicant’s arguments, the applicant argues

“There is no motivation of Wheatley and Orban does not include a prima facie case of obviousness. There is no motivation for making the proposed combination, in part, because Orban’s clipping filter does not have any usefulness in connection with techniques described in Wheatley reference.”

The examiner respectfully disagrees. Wheatley discloses a “System 1200 may be designed to support one or more CDMA standards such as (1) the “TIA/EIA-950B Mobile Station-Base Station Compatability Standard for Dual-Mode Wideband Spread Spectrum Cellular System” (the IS-95 standard) ...” Wheatley discloses the system is designed for a wideband spread spectrum cellular.

Orban discloses a compressor in a wideband system. The compressor comprises a filters dedicated for filtering different bands (Fig. 2, labels 15-17) coupled to a peak limiter (Fig. 1, label 12). Both Orban and Wheatley discloses a system for wideband communication and reducing using either compressor and peak limiter as disclosed by Orban (Fig. 1, labels 10 and 12) or eliminating

the peaks in the input signal which reduces the PAR by using a peak limiter or peak reducing system as disclosed by Wheatley (Fig. 7).

The motivation for replacing the FIR filter disclosed by Wheatley (Fig. 7, label 812) with the multiple filters for each band disclosed by Orban (Fig. 2, labels 15-17) to pass the band as per each filter (Col. 3, lines 79-50) within a wideband system so to "improve the peak to average power ratio to obtain greater loudness within the defined limits to the channel's peak capacity." (Col. 1, lines 17-21, lines 24-33, and lines 53-66)

- c. On page 2 of the applicant's arguments, the applicant argues the rejections of claims 10-11 under 35 USC 103 based upon the combination of Wheatley, Orban and Birchler and claims 21-24 under 35 USC 103 based upon the combination of Wheatley, Hahm and Birchler does not include prima facie case of obviousness since the combination of Wheatley and Hahm and Wheatley and Orban cannot be combined. The examiner respectfully disagrees. Please refer to the rebuttal to the arguments stated in a) and b).

Note: The rejections to the claims are rejected as stated in the previous office action. A copy has been included below.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 2-9,16-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley, III et al (US Patent No.: 6741661) in view of Hahm (US Patent No.: 6356606).

a. **Claim 3**, Wheatley, III et al discloses searching for at least one peak above a threshold within a window (page 1, paragraph [0013], lines 2-3 and page 5, paragraph [0055]), adding a threshold-correcting signal (page 1, paragraph [0013], lines 2-5) and examining or filtering the composite signal for other peaks found due to spurious out-of-band spectrum artifacts and comprises multiple impulse response clipping to perform the same steps again. (Pages 1-2, paragraph [0013], line 6-8, page 1, paragraph [0006], and Fig. 8, labels 913,914,916,918,and 920) Although Wheatley, III, et al discloses multiplying the peaks with filtered samples to eliminate peaks above a threshold (Fig. 7), Wheatley III, et al does not disclose adding the peaks with a threshold correcting signal. Hahm discloses a limiting peak method comprising adding the peak detected above a threshold with a threshold correcting signal (Fig. 3, labels 10,20,60 and 50 and Fig. 4a-4e) It would be obvious to one skilled in the art to replace the multiplying of the threshold correcting signal with the received signal as disclosed by Wheatley III et al with the addition step as disclosed by Hahm to reduce peak to average ratio without introducing significant out of band spectrum artifacts. (Abstract, lines 8-10)

- b. **Claim 2**, Wheatley, III et al discloses finding peaks above a threshold within a window, which can be the highest peak within the window. (Pages 1-2, paragraph [0013], lines 2-3 and page 5, paragraph [0055])
- c. **Claim 4**, Wheatley, III et al discloses searching and adjusting the peaks above a threshold for a certain number of transactions. (Fig. 8, label 913, page 1, paragraph [0013], lines 6-8 and pages 6-7, paragraph [0079], lines 10-15)
- d. **Claim 5**, Wheatley, III et al discloses continuously searching for peaks within the first window and correcting those peaks. (Fig. 8, labels 913,914,916,918, and 920)
- e. **Claim 6**, Wheatley, III et al discloses changing the window (Fig. 8, labels 908 and 910) and repeating the process of searching, correcting and reexamining the corrected signal. (Fig. 8)
- f. **Claims 7 and 8**, Wheatley, III et al discloses continuously searching for additional peaks after correcting the signal, which were introduced by such a process (Fig. 8, labels 913,914,916,918,920) within a second window (Fig. 8, label 910) and correcting the peaks. (Fig. 8, label 920)
- g. **Claim 16** inherits all the limitations of claim 1, but claim 1 does not recite calculating a magnitude and polarity of a threshold-correcting signal for the first highest peak and selectively adding the threshold correcting signal. Wheatley, III et al inherently discloses calculating the magnitude and polarity by generating a threshold envelope. (Fig. 3, Fig. 4, Fig. 5, Fig. 6, Fig. 7, label 808, and page 5, paragraph [0058], lines 3-7) Regarding the new amendments to

claim 16, Wheatley III, et al disclose checking the maximum peak to a threshold before correcting the samples within the window. (Fig. 8, label 914) Wheatley III et al discloses continuously checking the window for a set of iterations (Fig. 8, labels 913, 914, 916, 918, 920) for any peaks over a threshold, thus if, due to the adding of the threshold correct signal causes a peak or spike to appear within the window of the signal with the added correcting signal, a peak or spike is detected to be above a threshold, signal will, again, be corrected with the correcting signal. If no such detection is found, then another iteration will occur without correction or a new window is selected. (Fig. 8, labels 908, 910, 912, 913, 914, 916, 918, 920)

- h. **Claim 17**, Wheatley, III et al discloses researching the corrected signal within the same window and correcting a signal within that window if the peak-to-average power for the current samples is greater than the peak-to-average target power, which indicates that all the peaks within the window are below the threshold and no out-of-band signals have been found. (Fig. 8, label 914)
- i. **Claim 18** inherits all the limitations of claims 6, 16, but neither claim 6 nor 16 recites the limitation of searching for a second highest peak and examining the composite signal if the second highest peak is corrected. Although Wheatley, III et al does not explicitly state searching for the second highest peak, Wheatley, III et al discloses searching for peaks above a threshold, which can be the highest peak within that window. Also, Wheatley, III et al discloses searching and correcting the signal within the same window if the peak-to-



average ratio is not less than the target value, which indicates that if the highest peak is corrected, the searching and correcting more peaks within that window will occur. (Fig. 8, labels 912,913,914,916,918, and 920)

j. **Claim 19** inherits all the limitations of claim 7.

k. **Claim 20** inherits all the limitations of claim 8.

3. **Claims 12-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley III, et al (US Patent No.: 6741661) in view of Orban (US Patent No.: 4460871).

a. **Claim 12**, Wheatley III, et al disclose an amplifier (Fig. 7, label 816), a peak compensating device comprising a peak detector for detecting the highest peak above a threshold within a window (Fig. 7, labels 808, and 810, and Fig. 8, labels 910,912,913,914,916,918,920), a clipping filter for generating a threshold-compensating signal inresponse to detecting the presence of at least a highest peak (Fig. 8, labels 910,912,913,914,916,918,920 and Fig. 7, labels 812,814,806,808,810). Although Wheatley III et al does not disclose at least one carrier filter for obtaining the sum of the finite impulse response for each carrier frequency of the composite signal, Orban discloses a clipping filter comprising multiple clipping filters for multiple bands and calculating the sum of the outputs from the clipping filters (Fig. 2, labels 15-17 and 31). Although Orban does not disclose carrier frequencies, Wheatley III, et al discloses a CDMA communication system, which inherently discloses multiple users and

multiple carrier frequencies. () It would be obvious to one skilled in the art to incorporate multiple clipping filters for different frequencies as disclosed by Orban into Wheatley III, et al's invention to provide unique overshoot protection. (Abstract, line 12)

- b. **Claim 13** inherits all the limitations of claim 12 but claim 12 does not recite the limitation for having one carrier filter for each carrier frequency and at least one carrier filter being weighted differently than the remaining carrier filters. Orban discloses a filter for each multiband frequency and the weights for each filter is controlled by a control signal means and depends on the outputs from the filters. (Fig. 2, labels 15-17, 19-21, 27-29, 23-25 and 33-34) Orban inherently discloses different outputs from the filters, which would cause different adjustments to the weightings applied to the output of the carrier filters. (Fig. 2, labels 15-17) It would be obvious to one skilled in the art to incorporate multiple clipping filters for different frequencies as disclosed by Orban into Wheatley III, et al's invention to provide unique overshoot protection. (Abstract, line 12)
- c. **Claim 14**, Orban discloses weighting the outputs from the filters based on the outputs itself. (Fig. 2, labels 15-17, 19-21, 23-25, 27-28 and 33-34) Orban inherently discloses the outputs from the filters are different from each other, thus the weights applied to each output respectively would be distinct. Although Orban does not disclose different carrier frequencies, Wheatley III et al disclose a CDMA communication system, which inherently comprises multiple users and multiple carrier frequencies. () It would be obvious to one skilled in the art to

incorporate multiple clipping filters for different frequencies as disclosed by Orban into Wheatley III, et al's invention to provide unique overshoot protection. (Abstract, line 12)

4. **Claims 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley III, et al (US Patent No.: 6741661) in view of Orban (US Patent No.: 4460871) and further in view of Birchler et al (US Patent No.: 5638403).
  - a. **Claim 10**, Although Wheatley III, et al and Orban fail to disclose a delay device and a summing device, Birchler et al discloses a peak to average signal reduction system comprising delaying the threshold correcting signal (Fig. 9, label 901 and Col. 4, lines 33-53) and attenuating the threshold correcting signal to the composite signal (Fig. 10, label 1002, Col. 4, lines 33-53) It would be obvious to one skilled in the art to replace multiplying the filter samples within the window as disclosed by Wheatley III, et al with aligning the correction signal with the maximum peak and attenuating the correction signal with the composite signal as disclosed by Birchler et al to prevent splatter. (Col. 4, line 53)
  - b. **Claim 11**, Wheatley III, et al discloses measuring the polarity and magnitude of the threshold compensating signal (Fig. 3, Fig. 8, labels 916,918 and 920, Fig. 3, Fig. 4 and Fig. 5), and a multiplier for multiplying the detected highest peak with the calculated magnitude and polarity. (Fig. 8, label 920 and Fig. 7, label 814)

5. **Claims 21-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley III, et al (US Patent No.: 6741661) in view of Hahm (US Patent No.: 6356606) and further in view of Birchler et al (US Patent No.: 5638403).
- a. **Claim 21**, Birchler et al discloses determining the location of the at least one peak (Fig. 7, label T<sub>max</sub>) and adding the threshold correcting signal (Fig. 9) at the determined location of the at least one peak (Fig. 10). It would be obvious to one skilled in the art to replace multiplying the filter samples within the window as disclosed by Wheatley III, et al with aligning the correction signal with the maximum peak and attenuating the correction signal with the composite signal as disclosed by Birchler et al to prevent splatter. (Col. 4, line 53)
- b. **Claim 22**, Birchler et al discloses delaying the signal an amount corresponding to a time associated with creating the threshold correcting signal. (Fig. 8, 9 and 10).
- c. **Claim 23** inherits all the limitations of claim 21.
- d. **Claim 24** inherits all the limitations of claim 22.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linda Wong whose telephone number is 571-272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dac Ha can be reached on (571) 272-3040. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Linda Wong

A handwritten signature in black ink, appearing to read 'Linda Wong', with a long horizontal flourish extending to the right.

**DACHA**  
**PRIMARY EXAMINER**